

Design and Implementation of a Machine Learning Model for Depression Detection

Adsure Pranav Balasaheb, Kaushal Santosh Suryawanshi, Arun Deepak Pattipaka
Nikam Shreyash Atul, Asst. Prof. Krushna M. Borude,

Department of Computer Engineering
SGVSS Adsul Technical Campus, Chas, Ahmednagar

Abstract: Mental health disorders such as depression and anorexia are growing public health concerns that require timely and accurate detection for effective intervention. With the widespread use of online social networks, social media content offers a rich source of information to assess individuals' emotional states in real time. This study proposes a machine learning-based framework that automatically detects signs of depression and anorexia by analyzing emotional patterns expressed in users' social media posts. The model introduces two key emotional representations: static features that capture fine-grained sub-emotions derived from clustering word embeddings within coarse emotion categories, and dynamic features that quantify the temporal variability of these sub-emotions over time. By leveraging these complementary representations, the proposed system enhances both the accuracy and interpretability of mental health detection compared to conventional sentiment-based approaches. Experiments conducted on benchmark datasets collected from Reddit demonstrate that the fusion of static and dynamic emotional features achieves state-of-the-art performance in depression detection and competitive results in anorexia prediction. Furthermore, a practical implementation integrating an online social networking module with emotion detection and graphical monitoring capabilities illustrates the system's real-world applicability in providing scalable and accessible mental health support tools. This work highlights the potential of emotion-driven analysis in advancing computational mental health diagnostics and enabling early intervention.

Keywords: Depression Detection, Anorexia Prediction, Emotion Analysis, Social Media Mining, Machine Learning

